

Application No.: 10/582,454
Amendment Dated: January 30, 2008
Reply to Office Action of: November 1, 2007

MAT-8838US

Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 4. This sheet replaces the original sheet.

Remarks/Arguments:

The present invention relates to a power supply apparatus. Specifically, the power supply comprises a transformer and a rectifier. On page 2, the Official Action objects to Fig. 4 because it should be designated as "PRIOR ART." Applicants have, therefore, amended Fig. 4 to be labeled "PRIOR ART". Withdrawal of the objection is respectfully requested.

On page 3, the Official Action rejects claims 1, 2, 4 and 5 under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art Fig. 4 in view of de Vries (U.S. Patent No. 3,978,388). It is respectfully submitted, however, that the claims are patentable over the art of record for the reasons set forth below.

De Vries teaches a current supply for a remote control receiver. Specifically, de Vries consists of a full-wave rectifier and a Zener diode.

Applicants' invention, as recited by claim 1, includes a feature which is neither disclosed nor suggested by the art of record, namely:

wherein the diode conducts in only one direction independent of the DC voltage across the first and second output terminal.

Claim 1 relates to a conventional diode that is placed in parallel across the two output terminals of the power supply circuit. Specifically, the conventional diode conducts in only a single direction. This feature is found in the originally filed application on page 5, lines 1-12 and furthermore, as shown in element 10 in Fig. 1. No new matter has been added.

In Figs. 1, 3 and 4, de Vries teaches a full-wave rectifier with **Zener** diode 7 connected across output terminals 9 and 10. In col. 2, lines 56-60, de Vries goes on to teach that Zener diode 7 is used to limit the output voltage across terminals 9 and 10

("voltage limiter is in the form of Zener diode 7 connected in parallel with the DC voltage terminals of the full-wave rectifier 6"). Therefore, the combination of de Vries and Applicants' admitted prior art (AAPA) would teach a power supply circuit with a **Zener** diode across the output terminals of the circuit. It is known that Zener diodes are conventionally connected across the output terminals of rectification circuits in order to **limit** the output voltage.

Applicants' claim 1 is different than the combination of Applicants' AAPA and de Vries, because of the addition of a conventional diode which only allows current follow in one direction (*"wherein the diode conducts in only one direction independent of the DC voltage across the first and second output terminals"*). Applicants' conventional diode 10, as shown in Figs. 1, 2 and 3 allows a negatively charged body 7 to discharge to ground. This feature is disclosed on page 5, lines 2-3 of the specification (*"this negative potential turns on diode 10 and causes the electric charge stored in chargeable body 7 to discharge through diode 10 to the ground"*). An important reason for adding a conventional diode across the output terminals is to prevent current flow through diode 8 thereby avoiding the prevention of power supply device from starting. This feature is disclosed on page 5, lines 4-6 of the specification (*"prevents a current from flowing through rectifier diode 8, thereby avoiding to prevent power source device 1 from starting operation"*). For example, on page 2, lines 5-21, Applicants teach that conventional power sources may experience discharge current flowing through rectifier 8, which short circuits both the ends of the secondary winding 203 of step up transformer 2 (*"discharge current flows through rectifier diode 8 if chargeable body 7 is charged with a voltage which has a polarity reverse ... diode 8 is turned and short circuits both ends of secondary winding 2 and 3 of transformer 2. This prevents the self oscillator 4 from oscillating with using the inductances of windings 201 and 202"*). Applicants teach to avoid this phenomenon, a

Zener diode 105 may be inserted between chargeable body 7 and secondary winding 203. Zener diodes, however, are expensive and also decrease the output voltage of the power source (*"Zener diodes each having such a high Zener voltage are expensive and require a space for electrical insulation, hence preventing apparatuses from having small sizes. In addition, Zener diode 105 produces a high forward voltage, thus, decreasing the output voltage of the power source device 101 and reduces an efficiency"*).

Applicants' conventional diode 10 as shown in Fig. 1 and recited in claim 1 **allows current flow in only a single direction**, which allows chargeable body 7 to discharge to ground and not through the secondary winding 203. Therefore, combining the Zener diode as taught in de Vries with AAPA as shown in Fig. 4 would not teach the circuit as recited in claim 1. Specifically, adding a Zener diode across the output terminals of the power supply circuit would limit the output voltage and furthermore, allow current to flow **in both directions dependent on the voltage on the output terminals**.

It is because Applicants include the feature of *"wherein the diode conducts in only one direction independent of the DC voltage across the first and second output terminals,"* that the following advantages are achieved. An advantage is the ability to allow the chargeable body 7 to discharge to ground and not short out the secondary windings 203. Accordingly, for the reasons set forth above, claim 1 is patentable over the art of record.

Independent claim 4 has been similarly amended to claim 1. Thus, claim 4 is also patentable over the art of record for the reasons set forth above.

Claims 2, 3, 7, 8, 9 and 11 include all of the features of claim 1 from which they depend. Thus, claims 2, 3, 7-9 and 11 are also patentable over the art of record for the reasons set forth above.

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Claims 5, 6, 10 and 12-16 include all of the features of claim 4 from which they depend. Thus, claims 5, 6, 10 and 12-16 are also patentable over the art of record for the reasons set forth above.

New dependent claims 7-16 have been added to the application. These claims recite various features of the circuit including the rectifier diode and Zener diode. These claims are patentable by virtue of their dependency on allowable claims 1 and 4. Support for these claims can be found in the specification as originally filed on page 5, lines 1-27. No new matter has been added.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

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Attachment: Figure 4 (1 sheet)

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